

# Black Bear Population Analyses 2006

By Robert E. Rolley and Michele P. Woodford

## **Abstract**

Bear visitation rates averaged 53% for 18 bait station surveys conducted in the primary range (Zones A, A1, and B), and 18% for 7 surveys conducted in the peripheral range (Zone C). Population models produced a statewide estimate of approximately 12,850 bears in Fall, 2006. Bear populations appear to be within 15% of goals in the 3 northern Bear Management Zones but the population in Zone C is approximately 70% above goal. A harvest of 2,550 bears was recommended for the 2006 season.

## **Methods**

Bear bait station surveys were conducted by wildlife management and research personnel in the 18 counties comprising the primary bear range and 7 counties within the peripheral range in 2006. The surveys were run between 15 June and 15 July, and consisted of 50 bait stations placed at 0.5-mile intervals along drivable roads. A plastic mesh overwrap bag filled with approximately 2 lb. of fresh meat was securely wired to a tree about 7 ft above the ground at each bait station. Bait stations were checked for bear visitations after 7 nights.

A station was considered to have been visited by bears if the bag of meat was gone and the wire securing it had been stretched or broken, or by marks on the trees and/or trails leading to the station. Bait stations were considered inoperable and not included in the calculations if they could not be found or if animals other than bears had taken the bait.

Three-year running average visitation rates ( $[\text{year} \times 2 + \text{year}^{+1}]/3$  for first year;  $[\text{year}^{-1} + \text{year} \times 2]/3$  for last year, and  $[\text{year}^{-1} + \text{year} + \text{year}^{+1}]/3$  for all other years) were used as an index to bear population trends. Combining years reduced annual fluctuations resulting from rather small sample sizes and large annual changes in the abundance of natural foods.

All bears legally harvested were registered at DNR or cooperative stations. An upper first premolar was collected as the bears were registered, and the sex and county of kill were recorded for each bear. Registration personnel were provided instructions and envelopes for storing the teeth. Teeth were sent to the Matson's Lab in Milltown, MT for processing, and ages were assigned by counting annuli in the cementum.

Wisconsin's Bear Population Model was adapted from the one developed and used in Minnesota. That model was updated in 2005 to include the most recent bear harvest, age, and bait station data, and used to estimate bear populations in each Bear Management Zone (Figure 1). Starting population size in the model was adjusted in zones A, A1, and C in 2005 to improve the correlation between model simulated population trends and trends in bait-station visitations.

## **Results**

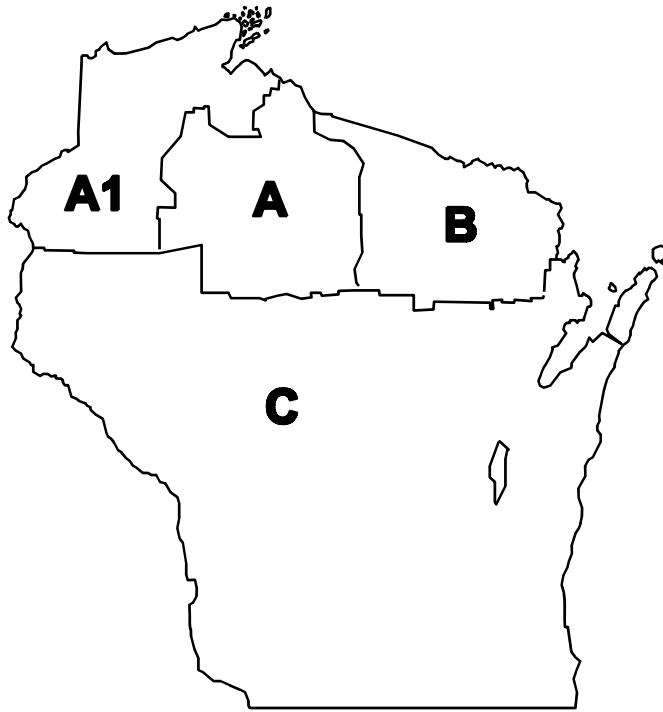
Bear visitation rates in the 2006 bait station survey averaged 63% in Zone A, 49% in Zone A1, 48% in Zone B, and 53% in the primary bear range (Zones A, A1, and B combined) (Table 1). Bear visitation rates in Zone C (peripheral range) averaged 18%.

The 3-year mean visitation rates in the primary bear range increased rather steadily from 1985 (32%) to 1996 (55%) and then largely stabilized (1997-2006 average = 55%, Fig. 2). In contrast, the Bear Bait Station Survey suggests a marked increase in the bear population in Zone C during the late 1990s and early 2000s; 3-year average visitation rates increased from 21% to 38% during 1995-2004. Visitation rates appear to have stabilized or perhaps declined in the last couple of years in Zone C.

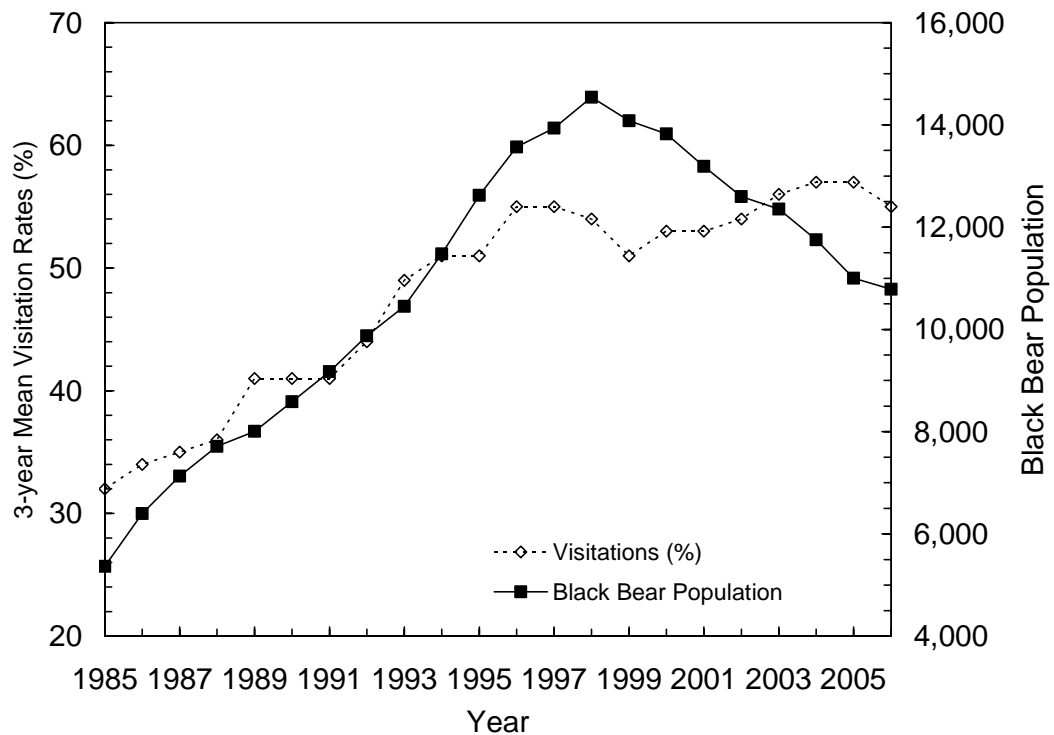
Teeth were collected from 2,165 of the 2,645 bears harvested in 2005. The age structure of bears harvested during 1986-2005 has been relatively stable (Table 2). Mean ages of bears harvested have ranged from 3.1 - 4.3 years for males and 4.2 - 5.3 years for females.

Adjustments made in 2005 to the starting population size for bear population models in zones A, A1, and C improved correlations between simulated population trends and trends in bait-station visitations. The models produced a statewide population estimate of approximately 12,850 bears in Fall, 2006 (Table 3). This included 5,300 bears in Zone A, 3,600 in Zone A1, 1,900 in Zone B, and 2,050 in Zone C. The 2005 population estimates equate to bear densities of 1.0 bears/mi<sup>2</sup> of bear range in Zone A, 0.7 bears/mi<sup>2</sup> in Zone A1, 0.4 bears/mi<sup>2</sup> in Zone B, and 0.3 bears/mi<sup>2</sup> of occupied range in Zone C. Population trends calculated by the models for the primary range generally paralleled those suggested by the Bear Bait Station Surveys (Fig. 2). The population model for Zone C suggests a steady increase in the population during 1988-2003. The model suggests the Zone C population may have stabilized in the last few years.

Bear population estimates in Zones A, A1, and B are within 15% of goals, whereas the bear population estimate in Zone C is approximately 70% above the prescribed goal. The WDNR Bear Advisory Committee recommended a harvest of 2,525 bears for the 2005 season. This included 825 bears in Zone A, 550 in Zone A1, 550 in Zone B, and 600 in Zone C.



**Figure 1.** Wisconsin's Black Bear Management Zones, 2006.



**Figure 2.** Bear visitation rates on bait station surveys (3-yr running average) and population estimates calculated by the model for the primary range (Zones A, A1, and B), 1985-2006.

**Table 1.** *Percent of bear bait stations visited by bears, 1995-2006.*

County	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Ashland	68	79	68	48	68	82	63	51	57	86	71	76
Bayfield	77	67	32	83	83	67	64	79	65	46	75	52
Burnett	23	50	39	63	60	71	84	53	36	32	46	43
Douglas	58	41	43	37	62	61	30	33	33	30	30	30
Florence	50	44	38	46	64	54	----	34	53	67	83	66
Forest	59	66	88	26	43	61	55	58	60	74	62	63
Iron	55	69	86	58	48	41	42	47	55	79	64	69
Langlade	49	45	62	29	30	48	44	56	53	54	63	53
Lincoln	72	60	76	52	41	55	33	68	44	27	30	39
Marinette	7	26	19	26	44	35	39	65	24	47	50	48
Oconto	2	12	16	6	18	6	25	47	28	31	23	17
Oneida	12	32	67	23	66	23	36	63	95	70	48	54
Price	64	66	88	43	31	50	50	42	68	78	26	33
Rusk	64	97	85	71	84	84	91	72	58	80	98	68
Sawyer	52	87	93	66	76	68	91	91	79	67	90	77
Taylor	18	48	46	62	52	42	36	50	57	58	90	66
Vilas	53	57	57	36	52	31	34	26	47	33	32	56
Washburn	91	85	84	60	90	91	74	88	85	84	92	70
<b>Primary Range</b>	<b>48</b>	<b>57</b>	<b>60</b>	<b>47</b>	<b>56</b>	<b>51</b>	<b>52</b>	<b>56</b>	<b>54</b>	<b>58</b>	<b>60</b>	<b>53</b>
Barron	--	--	16	26	11	30	28	17	11	20	30	5
Chippewa	30	39	27	15	52	41	20	44	50	42	47	17
Clark	19	22	6	12	33	16	39	54	52	64	48	28
Jackson	6	11	13	27	0	28	11	20	15	14	8	24
Marathon	29	20	32	7	8	13	32	66	69	65	53	45
Menominee	19	14	14	8	5	46	6	11	9	35	14	0
Polk	--	--	2	8	4	9	7	2	---	---	---	---
Shawano	--	0	0	0	0	0	7	0	---	11	3	0
<b>Peripheral Range</b>	<b>21</b>	<b>17</b>	<b>13</b>	<b>13</b>	<b>14</b>	<b>23</b>	<b>19</b>	<b>27</b>	<b>37</b>	<b>38</b>	<b>30</b>	<b>18</b>

**Table 2.** *Age classes of bears harvested in Wisconsin, 1986-2005.*

Year	Sex	Percent in age class			No. aged	Mean age
		1-2 yr	3-9 yr	10+ yr		
1986	Male	59.5	37.2	3.3	210	3.6
	Female	43.8	41.3	9.9	121	4.2
1987	Male	52.6	43.2	4.2	401	4.1
	Female	41.5	52.0	6.5	200	4.6
1988	Male	60.4	35.0	4.6	439	3.7
	Female	40.9	51.9	7.2	345	4.7
1989	Male	53.9	39.0	7.1	397	4.2
	Female	42.5	47.9	9.6	261	5.0
1990	Male	67.0	30.4	2.6	454	3.4
	Female	46.8	48.1	5.1	331	4.6
1991	Male	56.9	37.3	5.8	448	4.0
	Female	38.9	54.9	6.2	306	4.7
1992	Male	63.9	32.1	4.0	474	3.5
	Female	48.4	45.0	6.6	380	4.3
1993	Male	50.9	41.7	7.4	405	4.3
	Female	37.8	57.3	4.9	286	4.6
1994	Male	62.6	31.4	6.0	441	3.9
	Female	50.9	45.0	4.1	271	4.2
1995	Male	55.7	41.4	2.9	600	3.6
	Female	37.7	52.0	10.5	435	5.3
1996	Male	60.0	37.3	2.7	771	3.6
	Female	46.8	45.6	7.6	536	4.7
1997	Male	65.0	32.6	2.5	765	3.5
	Female	47.9	44.2	7.9	620	4.6
1998	Male	65.0	33.4	1.6	1,134	3.3
	Female	49.0	44.2	6.9	904	4.5
1999	Male	67.6	29.9	2.4	1,058	3.3
	Female	51.5	39.3	9.2	954	4.7
2000	Male	68.1	29.0	2.9	1,227	3.3
	Female	49.8	41.5	8.7	1,046	4.7
2001	Male	67.8	29.2	3.0	1,250	3.4
	Female	51.2	40.8	8.0	1,023	4.6
2002	Male	59.5	34.6	5.9	1,094	3.9
	Female	44.5	43.7	11.8	946	5.2
2003	Male	64.3	33.3	2.4	1,349	3.1
	Female	48.4	43.0	8.2	1,065	4.6
2004	Male	62.9	33.9	7.9	1,332	3.2
	Female	48.4	43.7	3.2	1,177	4.3
2005	Male	57.1	40.1	2.8	1,267	3.4
	Female	44.7	47.8	7.6	898	4.5

**Table 3.** *Modeled bear population estimates by Management Zone, 1988-2006<sup>a</sup>.*

Year	Bear Management Zone				State
	A	A1	B	C	
1988	3,500	2,700	1,550	700	8,450
1989	3,500	2,850	1,650	750	8,750
1990	3,700	3,100	1,800	850	9,450
1991	3,900	3,400	1,850	900	10,050
1992	4,100	3,750	2,000	1,000	10,850
1993	4,200	4,150	2,100	1,050	11,500
1994	4,550	4,750	2,200	1,100	12,600
1995	5,100	5,200	2,350	1,250	13,900
1996	5,700	5,450	2,400	1,300	14,850
1997	5,950	5,550	2,400	1,350	15,250
1998	6,350	5,700	2,450	1,500	16,000
1999	6,150	5,450	2,450	1,550	15,600
2000	6,050	5,300	2,500	1,650	15,500
2001	5,800	4,850	2,500	1,800	14,950
2002	5,400	4,650	2,500	1,850	14,400
2003	5,450	4,450	2,500	2,100	14,500
2004	5,300	4,000	2,450	2,150	13,900
2005	5,250	3,650	2,100	2,100	13,100
2006	5,300	3,600	1,900	2,050	12,850
Goal	4,600	3,300	2,200	1,200	11,300

<sup>a</sup> Population estimates for zones A, A1, and C and the statewide estimates differ from those previously reported due to adjustments to the starting population size in the model.